



STEPPING MOTOR VALVES

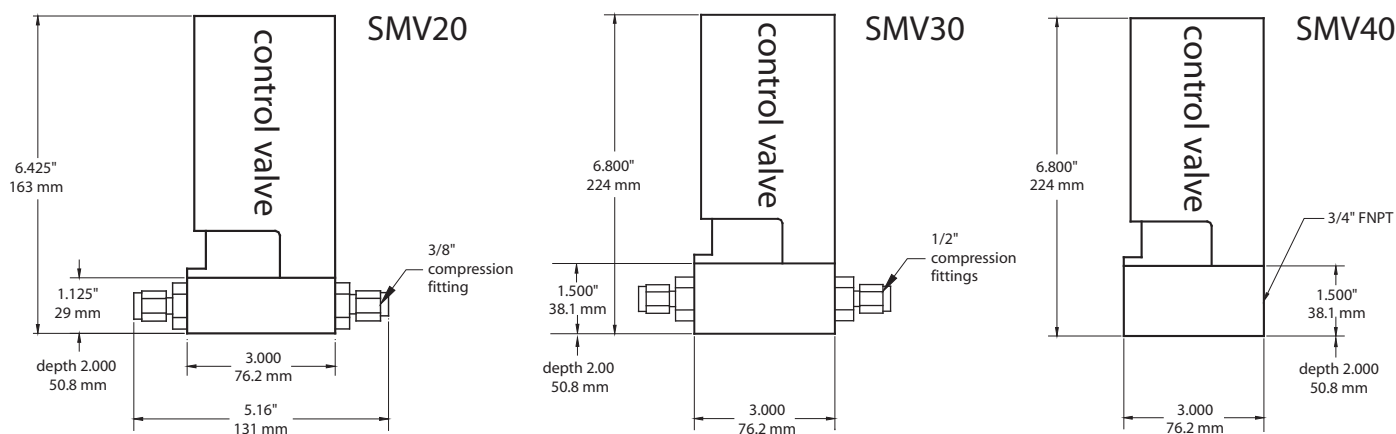
Design Features

- High precision two-way metering valves in aluminum or 316 SS for air/water.
- Unparalleled precision and resolution in controlling flow rates (0.0005" per step resolution standard, 0.000125" optional).
- Operate continuously without overheating.
- Eliminates coil heating problems associated with solenoid designs.

SMV Stepping Motor Valves



Dimensions SMV Stepping Motor Valves



STEPPING MOTOR VALVES

TABLE 77 - SPECIFICATIONS

ALUMINUM MODELS:	Aluminum housings and valve blocks, Viton® O-Rings, PFA closing pins.
STAINLESS STEEL / PTFE MODELS:	316 stainless steel valve blocks, PTFE-lined aluminum housing blocks, Viton® O-Rings, and PFA closing pins.
MAXIMUM FLOW RATES:	1000 L/min (air), 28 L/min (H ₂ O).
CONNECTIONS:	3/8", 1/2", compression and 3/4" FNPT.
ELECTRICAL CONNECTIONS:	9-pin "D"-connector, located at the side of the valve.
POWER INPUT:	12Vdc @ 800 mA, or +24 Vdc @ 600 mA, protected by a 1600mA resettable fuse.
DIRECTIONAL CONTROL SIGNAL:	12Vdc CMOS compatible logic level signal (10K input impedance). (Logic High >= 7.5 Vdc, Low <2.3 Vdc).
SPEED CONTROL SIGNAL:	Analog 0 to 2.5 Vdc (100K input impedance). TTL ON/OFF override: TTL low level to pins 7 and 3 (10K input impedance).
RESPONSE TIME:	100ms time constant.
PRESSURE DROP AT MAX. FLOW:	(700 to 1000) mbars 10 to 15 psid.
MAXIMUM OPERATING PRESSURE:	500 psig (35 bars).
MAXIMUM DIFFERENTIAL PRESSURE:	40 psig (2.7 bars).
GAS & AMBIENT TEMPERATURE:	32 °F to 122 °F (0 °C to 50 °C).

Operation

When the "DIRECTION" is set LOW (GND) the valve spindle travels downward (closes), when it is set HIGH, the valve spindle moves upward (opens). The "SPEED" voltage on pin 4 determines how quickly the valve opens or closes. The signal amplitude for the "SPEED" control signal must remain within the limits of 0 to +2.5 VDC. It may be necessary to override "DIRECTION" and "SPEED" signals with the preset (2.75 Vdc) speed control signal.

This can be accomplished with valve CLOSE and PURGE control signals (open collector NPN compatible). In order to CLOSE the valve, pin 3 on the 9-pin "D"-connector has to be connected to GND (pin 2). A GREEN light on the top of the valve will indicate a CLOSED valve condition. In order to PURGE the valve, pin 7 on the 9-pin "D"-connector has to be connected to GND (pin 2). A RED light on the top of the valve will indicate a fully OPEN valve condition. During normal operation the valve remains in the last position as it is deenergized.

After powering up, the valve will be automatically closed within the first 10 seconds and after that resumes control operation. Operating power and valve control signals are supplied via the "D"-connector.

General Description

A line of electronic two-way metering needle valves is presented. High precision linear stepping motors drive the valve spindle.

The resolution of the stepping motor driven needles is 0.0005"/step. Standard optional 0.000125"/step resolution available. Low differential pressure valves, may be operated continuously (100% duty cycle). Valves stay in position as when de-energized.

Advantages over solenoid operated valves include cool operations, i.e. there are no control operating problems due to coils heating up, extremely fine resolution, very low differential pressures and high operating pressures. Valves are controllable by TTL compatible logic level and analog 0 to 2.5 Vdc signals.

TABLE 78 - FLOW RATE FOR SMV

MODEL NUMBERS	MAXIMUM FLOW RATE				Cv	CONNECTIONS	MATERIAL
	AIR		H ₂ O				
	[L/min]	[scfh]	[L/min]	gal/min			
SMV20-A	200	424	5.6	1.48	0.336	3/8" compression	Aluminum
SMV20-S	200	424	5.6	1.48	0.336	3/8" compression	Stainless Steel
SMV30-A	500	1060	14.2	3.75	0.855	1/2" compression	Aluminum
SMV30-S	500	1060	14.2	3.75	0.855	1/2" compression	Stainless Steel
SMV40-A	1000	2119	28	7.4	1.735	3/4" FNPT	Aluminum
SMV40-S	1000	2119	28	7.4	1.735	3/4" FNPT	Stainless Steel